What is claimed:

1. A macromolecular protein structure comprising:

(a) a first influenza virus M1 protein and

(b) an additional structural protein selected from the group consisting of:

(i) a second influenza virus M1 protein;

(ii) (a) a first influenza virus HA protein,

(b) a second influenza virus HA protein;

(iii) (a) a first influenza virus NA protein,

(b) a second influenza virus NA protein; and

(iv) (a) a first influenza virus M2 protein,

(b) a second influenza virus M2 protein;

and wherein if said additional structural protein is not from subgroup (i), both members of at least one of subgroups (ii), (iii), and (iv) are included.

2. The macromolecular protein structure of claim 1, wherein the macromolecular protein structure is selected from the group consisting of a subviral particle, virus-like particle (VLP), capsomer structure or a portion thereof, a vaccine, a multivalent vaccine, and mixtures thereof.

3. The macromolecular protein structure of claim 1, wherein the additional structural protein is selected from the group consisting of nucleoprotein (NP) and membrane proteins from species other than noninfluenza viruses.

4. The macromolecular protein structure of claim 3, wherein the additional structural protein is a membrane protein from a non-influenza source.

5. The macromolecular protein structure of claim 1, wherein the protein structure is self-assembled in a host cell from a recombinant construct.

6. The macromolecular protein structure of claim 1, wherein at least one structural protein is derived from avian or mammalian origins.

7. The macromolecular protein structure of claim 1, wherein the structural protein is derived from different subtypes of influenza virus.

8. The macromolecular protein structure of claim 7, wherein the subtype of influenza virus is selected from the group consisting of subtype A and B influenza viruses.

9. The macromolecular protein structure of claim 7, wherein the influenza virus comprises a wild-type influenza virus.

10. The macromolecular protein structure of claim 1, wherein said macromolecular protein structure comprises at least one structural protein that has the ability to self-assemble into heterotypic virus-like particles (VLPs).

11. A macromolecular protein structure of claim 2, wherein a portion of at least one protein comprises a chimeric protein structure having a moiety not produced by influenza virus.

12. A composition comprising the macromolecular protein structure of claim 2 and a carrier or diluent.

13. The composition of claim 12, further comprising an adjuvant.

14. The macromolecular protein structure of claim 2, wherein said structure is selected from compositions that exhibit hemagglutinin activity.

15. The macromolecular protein structure of claim 2, wherein said structure is selected from compositions that exhibit neuraminidase activity.

16. A macromolecular protein structure of claim 2, comprising conformational epitopes of influenza VLP that induce influenza virus neutralizing antibodies.

17. A vaccine composition comprising the macromolecular protein structure of claim 16 and a carrier or diluent.

18. A method for producing a VLP derived from influenza, the method comprising:

(a) constructing a recombinant construct encoding influenza structural genes, wherein the recombinant baculovirus encodes M1, HA, and at least one first structural protein derived from influenza virus;

(b) transfecting, infecting, or transforming a suitable host cell with said recombinant baculovirus, and culturing the host cell under conditions which permit the expression of M1, HA and at least one structural protein derived from influenza virus;

(c) allowing formation of a VLP in said host cell;

(d) harvesting infected cell media containing a functional influenza VLP; and

(e) purifying the VLP.

19. The method of claim 18, wherein the structural protein derived from influenza virus is selected from the group consisting of NA, M2, and NP.

20. The method of claim 18, wherein at least one structural protein is derived from avian or mammalian origins.

21. The method of claim 18, wherein the structural protein is selected from the group consisting of subtype A and B influenza viruses.

22. The method of claim 18, wherein the host cell is a eukaryotic cell.

23. The method of claim 18, wherein the VLP comprises a chimeric VLP.

24. The method of claim 18, further comprising the step of:

(a) co-transfecting, co-infecting or co-transforming the host cell with a second recombinant construct which encodes a second influenza protein, whereby said second influenza protein is incorporated within the VLP.

25. The method of formulating a drug substance containing an influenza VLP comprising:

(a) introducing recombinant constructs encoding influenza viral genes into host cells;

(b) allowing self-assembly of the recombinant influenza viral proteins into a functional homotypic or heterotypic VLP in cells;

(c) isolating and purifying the influenza VLP; and

(d) formulating a drug substance containing the influenza VLP.

26. The method of claim 25, wherein the drug substance further comprises an adjuvant.

27. A method for formulating a drug product, the method comprising the step of mixing the drug substance of claim 25 containing an influenza VLP with a lipid vesicle.

28. The method of claim 27, wherein the lipid vesicle is a non-ionic lipid vesicle.

29. A method for detecting humoral immunity to influenza virus infection in a vertebrate comprising:

(a) providing a test reagent including an effective antibody-detecting amount of influenza virus protein having at least one conformational epitope of an influenza virus macromolecular structure;

(b) contacting the test reagent with a sample of bodily fluid from a vertebrate to be examined for influenza virus infection;

(c) allowing influenza virus specific antibodies contained in said sample to bind to said conformational epitope of an influenza virus macromolecular structure to form antigen-antibody complexes;

(d) separating said complexes from unbound complexes;

(e) contacting the complexes with a detectably labeled immunoglobulin-binding agent; and

(f) determining the amount of the detectably labeled immunoglobulin-binding agent that bound to said complexes.

30. A method of detecting influenza virus in a specimen from an animal or human suspected of being infected with said virus comprising:

(a) providing antibodies having a specificity to at least one conformational epitope of the particle of said influenza virus, wherein the antibodies have a detectable signal producing label, or are attached to a detectably labeled reagent;

(b) contacting the specimen with said antibodies;

(c) allowing the antibodies to bind to the influenza virus; and

(d) determining the presence of influenza virus present in the specimen by means of the detectable label.

31. A method of treatment which comprises administering to a vertebrate an effective amount of the composition of claim 13.

32. A method of preventing influenza which comprises administering to a vertebrate an effective amount of the vaccine formulation of claim 17.

33. A method of providing a protective immune response which comprises administering the composition of claim 13.